Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

Natural Sciences and Engineering Research Council of Canada / Conseil de recherches en sciences naturelles et en génie du Canada

Social Sciences and Humanities Research Council of Canada / Conseil de recherches en sciences humaines du Canada

The Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council of Canada (SSHRC) are federal funding agencies that support research and research training in Canadian postsecondary institutions and hospitals. Our collective role is to invest in the best research and brightest minds in the country, and to facilitate knowledge translation and mobilization, social innovation and commercialization. Individually and collectively, we provide leadership for the nation's research community, and ensure that cutting edge Canadian research and innovation is well placed on the international stage for the benefit of Canadians.

Canada at the Leading Edge:
Common Vision, Concerted Plan

Recommendations

Increase investment in CIHR, NSERC and SSHRC to:

1. **expand Canada's research excellence;**
2. **support Canada's top postdoctoral fellows; and**
3. **lead strategic partnerships on priority challenges for Canada.**

Introduction: Research as a cornerstone of economic recovery

In recent years, the Government of Canada has made significant investments and launched several initiatives to position Canada in the global knowledge-based society and economy. These investments were made to mobilize science and technology to Canada's advantage, ensure high quality education and research, stimulate the economy, generate new jobs, and improve the quality of life of Canadians. Research excellence and creativity are now understood as key assets for national success and international competitiveness.

The R&D advances in Canadian institutions are impressive, as is Canada's high ranking in the quality of its research and postsecondary education. Through innovation and the application of the best ideas to new policies, products, goods and services, Canada is becoming stronger, more competitive and better able to sustain economic growth through highs and lows. Canada's research efforts will therefore be a key determinant in the country's economic performance as we strive to recover from the current recession. Indeed, the Organisation for Economic Co-operation and Development (OECD) has demonstrated that, far from being a luxury affordable only during prosperous economic times, research and innovation must now play a key role in the recovery of economies around the world. In a recent report, the OECD specifically promotes policies that focus public support on long- term and risky research,

research conducted by start-ups, and research addressing societal challenges such as the environment and an aging population. Further, the OECD recommends that using existing instruments and vehicles for this type of research support can help maximize short-term impact.1 Countries such as the United States, the United Kingdom and Japan have put such policies in place, recognizing research and innovation as more than merely stimulus measures: they are also essential to long-term, post-crisis national prosperity.

Innovation and geographic clusters

Geographic clusters—regions where firms, institutions and communities involved in the same sector tend to gather—are key factors for success in the global economy. David Wolfe and Meric Gertler at the University of Toronto are researching the dynamics of clusters, such as the wireless cluster found in Calgary, the biomedical cluster in Toronto, and the software and digital media cluster in Kitchener-Waterloo. Their results develop strategies to stimulate innovation and economic capacity across the country, presenting significant implications for policy-makers and industry stakeholders.

The Science, Technology and Innovation Council's (STIC) *State of the Nation on Innovation 2008,*[2] the Council of Canadian Academies' 2009 report *Innovation and Business Strategy: Why Canada Falls Short,*[3] and the *Compete to Win*[4] report of the Competition Policy Review Panel, all point to what Canada must do to perform at the leading edge of research and innovation. This brings to focus the importance of innovation for economic recovery.

Investments in research benefit society in three key ways. First, these investments support research activities that sustain the rich learning environment required to supply Canada's labour force with highly qualified graduates. Students, especially those pursuing advanced degrees, benefit directly from the opportunity to participate in funded, world-class research projects during the course of their studies. The median annual earnings of graduates two years after graduation reflects the value of advanced degrees in the Canadian economy: there is a 33 per cent earning premium for students with masters degrees over those with bachelors, and an additional eight per cent for those with doctorates. Second, investments in research provide Canada with the capacity to respond to the pressing knowledge needs of the day, including climate change, the shift to a service economy, new geo-political and socio-cultural patterns, and the introduction of alternative forms of energy. Third, research

"The number one reason to fund research well and with vision is to attract the very best researchers from around the world. Once [in Canada], they can prepare Canada's next generation of graduates--masters, PhDs and postdoctorates, including the finest foreign students. All else flows from this."

Mike Lazaridis, president and co-CEO, Research in Motion

[1] OECD. Policy Responses to the Economic Crisis: Investing in Innovation for Long-Term Growth. June 2009. http://www.oecd.org/dataoecd/59/45/42983414.pdf

[2] STIC: State of the Nation on Innovation in 2008 (2009) http://www.stic-csti.ca/eic/site/stic-csti.nsf/eng/00030.html

[3] Council of Canadian Academies (CCA) Report on Business Innovation (2009) http://www.scienceadvice.ca/our_next_projects.html

[4] Compete to Win (2008) http://www.ic.gc.ca/eic/site/cprp-gepmc.nsf/vwapj/Compete_to_Win.pdf/$FILE/Compete_to_Win.pdf

investments contribute to the strategic reservoir of knowledge and ideas that will be drawn upon in the longer-term to address questions and problems that are not yet on the horizon.

Investing in research: a multi-pronged approach

Research investments must strike the right balance among investments in capital, infrastructure, highly qualified personnel and research operations.

In its recent economic stimulus package, the Government of Canada has made significant investments in research infrastructure in universities, colleges and research hospitals. In recent years, Canada has also invested significantly in highly qualified personnel through programs such as the Canada Research Chairs, the Canada Graduate Scholarships and the Vanier Scholarships. Over the last decade, the proportion of federal funding for people and infrastructure has increased, while the proportion of federal funding for the direct costs of research has decreased. This funding covers the basic costs of carrying out research activities and is critical for enabling our researchers, including those recruited through the Canada Research Chairs Program, to compete at international levels of excellence. Renewed investment in funding for operational research costs, coupled with strengthened funding for indirect costs, is now required to maximize the return on our investments in people and in infrastructure, and to ensure that Canadian research remains world-class and contributes to the development of the next generation of highly skilled workers.

CIHR, NSERC and SSHRC share a common vision to develop a more agile, dynamic, and responsive approach to funding research to exploit Canada's strengths to their full potential, to raise the bar of excellence, and to ensure the international competitiveness of Canadian research, creativity and innovation. The government now has an opportunity to make additional investments in research through these federal agencies that will have a significant long-term impact on Canada's productivity and international competitiveness.

Recommendation 1: Increase investment in CIHR, NSERC and SSHRC to expand Canada's research excellence.

The best ideas come from the brightest minds. Providing researchers with sufficient support to carry out their work will ensure a sustained supply of ideas, knowledge and expertise to help us address the pressing problems the world faces today, as well as those we have yet to identify. New investment will also optimize previous federal investments in research infrastructure and capacity for innovation in all regions of the country. It will have a direct short-term impact on the economy as researchers use their grants to hire personnel and buy the supplies they need to advance their research. More significantly, sustained

Genetic discovery prompts life-saving surgeries

Memorial University researchers have discovered a gene responsible for a deadly heart condition highly prevalent in Newfoundland and Labrador. Knowing where the responsible gene is located has made it possible to identify who is a carrier. Doctors are implanting defibrillators in the hearts of adult carriers so that a shock can be delivered should ventricular fibrillation—potentially fatal irregular heart beats—occur. Nearly 100 defibrillators have been inserted in carriers, which has already saved many lives.

investment will further position Canada as a magnet for international research excellence, fuel innovation and creativity in all sectors, and help to create a rich environment for training the leaders of tomorrow.

Through their internationally recognised, peer-reviewed programs, CIHR, NSERC and SSHRC are well positioned to make sound investments in research excellence.

Recommendation 2: Increase investment in CIHR, NSERC and SSHRC to support Canada's top postdoctoral fellows.

Postdoctoral researchers are at the top of the advanced research training ladder. With the latest research skills and methodologies in hand, they are launching their own programs, building national and international networks and devoting their time exclusively to research while working at a stage that precedes a faculty position. As such, they play a key role in our country's ability to be at the leading edge of science and technology. Giving postdoctoral students a robust research experience is an essential component of their training, and will foster creativity and innovation.

Harmonizing tri-agency scholarship programs

CIHR, NSERC and SSHRC are working together to harmonize their graduate scholarships programs for greater efficiency and impact. Making the awards internationally competitive would help to brand Canada as a destination of choice for advanced education, and strengthen the skills and versatility of the Canadian workforce.

We have already invested heavily in these promising bright minds through such programs as the Canada Graduate Scholarships and the Vanier Scholarships. Increased investment in postdoctoral fellows would enhance Canada's ability to retain and attract the best doctoral graduates and build Canada's People Advantage as envisaged in the federal science and technology strategy. Thus, not only would such an investment help to fill the employment gap created by the recession, it would also complement the federal government's suite of prestigious support programs and continue to increase our ability to compete internationally by attracting and retaining the best minds.

Recommendation 3: Increase investment in CIHR, NSERC and SSHRC to lead strategic partnerships on priority challenges for Canada.

Acting quickly and bringing together all relevant stakeholders is key to innovation and to addressing domestic and global challenges. As shown by their recent initiatives in response to the H1N1 flu pandemic and to crises in the medical isotope, automotive and financial industries, the three federal research agencies have demonstrated their readiness to act jointly and rapidly to respond to emerging challenges of national and international importance. They have demonstrated their ability to support problem-based, solutions-driven research.

Further investment will help advance solutions to some of Canada's most challenging economic, health, environmental and societal problems, and will bring together academics, business owners, communities, and other stakeholders to seize exceptional strategic opportunities for regional, national and international partnerships. These investments will strengthen the ability of Canadian researchers to lead or participate in global research networks. They will support institutions and research teams to create effective partnerships that will enrich student training and give them the opportunity to acquire skills by working in other sectors. For example, these partnerships will be an important element of Canada's successful response to emerging global threats such as pandemics, and to challenges such as Alzheimer's disease. Investments in partnerships will also contribute to the innovation base of businesses and organizations, thereby creating an Entrepreneurial Advantage through partnered initiatives that are solution-driven, flexible and tailored to the specific nature of each challenge. The three agencies are positioned to work jointly with the government and Canadian institutions to identify key challenges and opportunities.

Keeping the Canadian auto industry competitive and sustainable

The Automotive Partnership Canada (APC) is a $145 million initiative involving funding from NSERC, the NRC, CFI, SSHRC and the Canada Excellence Research Chairs Program. An industry task force established in the fall of 2008 provided input and guidance on establishing the APC. Over the next five years, the program will support R&D projects in specific areas, including alternative fuels, next-generation manufacturing, advanced power trains and lighter or more sustainable materials. This investment will lead to greener, better-performing vehicles, and will help create jobs and strengthen the economy for future generations.

Concerted Plan for the Future: From Good to Great

Through its investments in postsecondary institutions, Canada has built a very strong research engine. In addition, a strong culture of collaboration has been built among universities and colleges, as well as other sectors. However, to win the race, whether in number of Nobel Prizes earned or societal/industrial impact achieved, Canada must shift to a higher gear. CIHR, NSERC and SSHRC are committed to raising the bar of excellence in Canadian research, and to developing a more dynamic, agile and responsive approach to research funding.

Postsecondary institutions have shown their commitment to creating 21st century research environments and infrastructure. Building on Canada's strengths and a commitment to excellence and maximum impact, the Government of Canada has an opportunity to make additional investments in creating Canada's Advantage, and help the nation emerge from the current recession in a strong position to compete with the best.

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